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jc853 U.S. PTO 06/23/00

NEW, CONTINUATION, DIVISIONAL OR CONTINUATION-IN-PART APPLICATION UNDER 37 C.F.R. §1.53(b)

Attorney Docket No. 0906S-000267

jc844 U.S. PTO 09/602922 06/23/00

Express Mail Label No. EL 486 616 566 US

Date June 23, 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Hon. Commissioner of Patents and Trademarks
Washington, D. C. 20231

Sir:

Transmitted herewith for filing under 37 C.F.R §1.53(b) is a patent application for COMPUTER-IMPLEMENTED VEHICLE REPAIR ANALYSIS SYSTEM

identified by: [ ] First named inventor _____
or [X] Attorney Docket No. (see above)

1. **Type of Application**

[X] This application is a new (non-continuing) application.

[ ] This application is a [ ] continuation / [ ] divisional / [ ] continuation-in-part of prior application No. _____. Amend the specification by inserting before the first line the sentence:

--This is a [continuation/division/continuation-in-part] of United States patent application No. _____, filed _____.--

[ ] The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

If for some reason applicant has not requested a sufficient extension of time in the parent application, and/or has not paid a sufficient fee for any necessary response in the parent application and/or for the extension of time necessary to prevent the abandonment of the parent application prior to the filing of this application, please consider this as a Request for an Extension for the required time period and/or authorization to charge our Deposit Account No. 08-0750 for any fee that may be due. THIS FORM IS BEING FILED IN TRIPLICATE: one copy for this application; one copy for use in connection with the Deposit Account (if applicable); and one copy for the above-mentioned parent application (if any extension of time is necessary).

2. **Contents of Application**

a. Specification of 31 pages;
[ ] A microfiche computer program (Appendix);
[ ] A nucleotide and/or amino acid sequence submission;

[ ] Because the enclosed application is in a non-English language, a verified English translation [ ] is enclosed [ ] will be filed.

[ ] Cancel original claims ____ of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing date purposes.)

b. [X] Drawings on 12 sheets;

c. [ ] A signed Oath/Declaration [ ] is enclosed / [X] will be filed in accordance with 37 C.F.R. §1.53(f).

The enclosed Oath/Declaration is [ ] newly executed / [ ] a copy from a prior application under 37 C.F.R. §1.63(d) / [ ] accompanied by a statement requesting the deletion of person(s) not inventors in the continuing application.

d. **Fees**

FILING FEE CALCULATION	Number Filed		Number Extra	Rate	Basic Fee $690.00
Total Claims	34 -	20 =	14 ×	$18.00 =	$252.00
Independent Claims	2 -	3 =	0 ×	$78.00 =	$0
Multiple Dependent Claim(s) Used				$260.00 =	
FILING FEE - NON-SMALL ENTITY					$942.00
FILING FEE - SMALL ENTITY: Reduction by 1/2 [ ] Verified Statement under 37 C.F.R. §1.27 is enclosed. [ ] Verified Statement filed in prior application.					
Assignment Recordal Fee ($40.00)					
37 C.F.R. §1.17(k) Fee (non-English application)					
TOTAL					**$942.00**

[ ] A check is enclosed to cover the calculated fees. The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to Deposit Account No. 08-0750. A duplicate copy of this document is enclosed.

[X] The calculated fees will be paid within the time allotted for completion of the filing requirements.

[ ] The calculated fees are to be charged to Deposit Account No. 08-0750. The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment, to said Deposit Account. A duplicate copy of this document is enclosed.

3. **Priority Information**

[ ] **Foreign Priority**: Priority based on _____ Application No. _____, filed _____, is claimed.

[ ] A copy of the above referenced priority document [ ] is enclosed / [ ] will be filed in due course, pursuant to 35 U.S.C. §119(a)-(d).

[ ] **Provisional Application Priority**: Priority based on United States Provisional Application No. ____, filed ____, is claimed under 35 U.S.C. §119(e).

Attorney Docket No. 0906S-000267

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4. **Other Submissions**

[ ] A Preliminary Amendment is enclosed.

[ ] An Information Disclosure Statement, ____ sheets of PTO Form 1449, and ____ patent(s)/publications/documents are enclosed.

[ ] A power of attorney

[ ] is submitted [ ] with the new Oath/Declaration.

[ ] is of record in the prior application and [ ] is in the original papers / [ ] a copy is enclosed.

[ ] An Assignment of the invention

[ ] is enclosed with a cover sheet pursuant to 37 C.F.R. §§3.11, 3.28 and 3.31.

[ ] is of record in a prior application. The assignment is to ____, and is recorded at Reel ____, Frame(s) ____.

[ ] An Establishment of Assignee's Right To Prosecute Application Under 37 C.F.R. §3.73(b), and Power Of Attorney is enclosed.

[X] An Express Mailing Certificate is enclosed.

[ ] Other: _____

_____

Attention is directed to the fact that the correspondence address for this application is:

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Respectfully,

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JC844 U.S. PTO
09/602922
06/23/00

Date: June 23, 2000

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

EXPRESS MAILING CERTIFICATE

Applicant:	Kelly et al.
Serial No. (if any):	To Be Assigned
For:	COMPUTER-IMPLEMENTED VEHICLE REPAIR ANALYSIS SYSTEM
Docket:	0906S-000267
Attorney:	John V. Biernacki
"Express Mail" Mailing Label Number	**EL 486 616 566 US**
Date of Deposit	**June 23, 2000**

I hereby certify and verify that the accompanying **3-page transmittal letter (in triplicate); 31-page patent application; 12 sheets of drawings (showing Figures 1 - 11); along with this Express Mailing Certificate and return postcard** are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10 on the date indicated above and are addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Marnie Brennan

0906S-000267

Attorney Docket No.: 0906S-000267

COMPUTER-IMPLEMENTED VEHICLE REPAIR ANALYSIS SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to a computer-implemented vehicle processing facility analysis system, more particularly, to a networked and distributed computer-implemented vehicle repair facility analysis system.

2. Background and Summary of the Invention

Vehicle repair shops handle a large volume of vehicles. Vehicles remain many days within the shops since the repair process has many time consuming steps. For example in a typical collision repair process, vehicles undergo a vehicle disassembly step, frame repair step, metal repair step, preparation step, painting step, reassembly step, and testing step. Delays invariably arise from a number of sources. Exemplary delay sources include the incorrect parts being delivered or an insurance company not quickly processing a vehicle collision claim.

Due to the large volume that repair shops handle, repair shop managers find it difficult to correctly diagnose what delays occur enough times to warrant correction. The delays that occur most frequently might be able to be diagnosed. However, delays that occur less frequently escape detection and correction.

Not only is the diagnosis of vehicle delays problematic, but it is difficult for a shop owner to obtain in a relatively straightforward way a comprehensive view of how the owner's shop is performing in terms of facility potential, profit potential and other factors relative to other shops, let alone know how it is performing relative to the top vehicle repair shops. Business analysis software packages exist, but are typically not directed to as many specifics (e.g., cycle time analysis, facility shift, and other factors) of a vehicle repair shop, and therefore are less complete. A non-limiting specific example includes the amount of paint used by technicians in the repair process. Typical business analysis software packages are not directed to analyzing the usage of paint and how such usage compares with other shops.

The present invention overcomes the aforementioned disadvantages as well as other disadvantages. In accordance with the teachings of the present invention, a computer-implemented method and apparatus is provided for tracking a vehicle during a vehicle-related multi-step process. A vehicle identifier is received for uniquely identifying a vehicle. A delay reason is received for why the vehicle was delayed during at least one of the multi-step processes. An association is stored among the delay reason, the step at which the vehicle delay occurred, and the vehicle identifier. The stored association is used to identify at least one delay reason for the vehicle.

In another embodiment of the present invention, a computer-implemented method and apparatus are provided for analyzing a vehicle facility processing business. A business performance data structure is stored in the memory of at least one computer

that is used to summarize business performance data related to the business. A business priority data structure is stored in the computer memory in order to summarize business priorities related to the business. A business projection data structure is stored in the computer memory in order to summarize business projections data related to the business. A production workforce shift profile data structure is stored in the memory in order to summarize production workforce shifts related to the business. A business summary report is generated using the business performance data structure, the business priorities data structure, the business projection data structure, and the workforce shift data structure.

Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the invention, are intended for purposes of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

Figure 1 is a system block diagram depicting the computer-implemented vehicle facility repair analysis system;

Figure 2 is a software module data flow diagram depicting the data flow among software modules of the present invention utilized to generate business analysis data;

Figure 3 is a structure chart depicting the web site structure of the present invention;

Figure 4 is a computer screen display depicting a succinct recap of business performance, priorities, projections, and production workforce shift report that was generated in accordance with the teachings of the present invention;

Figure 5 is a computer screen display depicting a vehicle tracking and cycle time assessment data processing screen;

Figure 6 is a computer screen display depicting the display of data associated with sales and marketing data;

Figure 7 is a computer screen display depicting the entry and display of detailed data associated with sales and marketing data of Figure 6;

Figure 8 is a computer screen display displaying the result of entering data via the computer screen display of Figure 7;

Figure 9 is a computer screen display depicting the display of data that was provided via the computer screen of Figure 7;

Figures 10a and 10b are a computer screen display depicting the entry and display of company financial data, owner's priority data, personnel & facility data, and technician workshift data; and

Figure 11 depicts a computer screen showing how an user's shop compares to other shops in selected measures.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 depicts a collision repair facility 30 being connected to a business analysis and transaction computer server 34 via a network such as the Internet 38. Collision repair facility 30 uses computer server 34 to analyze the collision repair facility's performance, priorities, business projections and workforce shifts.

At collision repair facility 30, computer 42 provides an interface 46 for an user to facility 30 to communicate with computer server 34. In the preferred embodiment, computer 42 is situated within facility 30 so that the status of a vehicle can be efficiently tracked as it is being repaired in facility 30. However, it is to be understood that the present invention is not limited to the user being only situated within the collision repair facility 30, but also includes an user physically remote from facility 30 but has knowledge of the vehicle's status in facility 30 wherein the process a vehicle is.

User 50 provides financial and other facility-related data so that business analysis module 60 that resides on computer server 34 can analyze the user-provided data. Business analysis module 60 examines user-provided financial, facility, personnel information, and priority assessment data to provide to the user an assessment of the collision repair facility's strengths, weaknesses, areas of opportunities, and business projections. For example, business analysis module 60 can indicate to user 50 that

based upon the user-provided input data, facility 30 has an opportunity for growth relative to industry guidelines. Module 60 can also indicate to the user how well facility 30 is doing relative to the top 25% of all other collision repair facility shops.

As another non-limiting example, business analysis module 60 receives from computer 42 vehicle repair processing cycle time data. The cycle time data includes not only at what step a vehicle is within the vehicle repair process, but also includes delay reasons and delay time amounts for any delays that have occurred at a step in the repair process. Business analysis module 60 uses the data to identify whether facility 30 has as one of its strengths a relatively fast time to process a vehicle repair.

Business analysis module 60 also can indicate what equipment the facility 30 can use to actualize opportunities or to overcome weaknesses in one or more areas. Business transaction module 64 interacts with business analysis module 60 and user 50 to automate the process of buying for user 50 the equipment that would improve the operations of facility 30. For example, if the business analysis module 60 had identified that facility 30 has a chronic problem of a shortage of movable carts. Business transaction module 64 is used to identify for the user sellers of movable carts. In this manner, the purchase of needed items is automated for the user by the present invention.

In the preferred embodiment of the present invention, a paint supply company provides the present invention to the owner of a collision repair shop. Through use by the owner of module 64 to purchase items, the present invention can recommend

products and services offered by the paint supply company, or products and services offered by companies that have co-branded with the paint supply company. The paint supply company providing the present invention also increases loyalty of the owner to the paint supply company even if no non-paint items are ordered.

Due to the networked environment in the preferred embodiment of the present invention, multiple collision facilities 56 can use computer server 34 to analyze and to transact business. However, it should be understood that the present invention can also be given to users on a computer storage medium (such as a CD-ROM). The user uses the software to analyze and transact business.

Figure 2 depicts data input and processing performed by business analysis module 60. An user provides customer financial data 80, customer, facility and personnel information 84, customer assessment of priorities 88, and production shift information 89 in order for business analysis module 60 to identify best practices 92, analytical worksheets 96, and forms and policies of the business 100. For example, customer financial data 80 includes refinish labor sales and other data items depicted in Figures 10a and 10b shown by reference numeral 80. Customer, facility and personnel information 84 includes number of metal stall including frame and other data items depicted in Figures 10a and 10b shown by reference numeral 84. Customer assessment of priorities 88 includes prioritizing financial measures and other items depicted in Figures 10a and 10b shown by reference numeral 88. Production shift

information 89 includes number of day shift technicians and other data items depicted in Figures 10a and 10b shown by reference numeral 89.

The present invention associates many best practices with the correct form to use. An example of such an association between best practice and the correct form is the efficient capability to track vehicle and cycle time (for example, see Figure 5). By clicking on the form to include it in the shop owner's personal inventory, the shop owner can create a customized Operations Manual.

In order to most efficiently and effectively acquire and generate the desired information, a website is provided to the user as depicted in Figure 3. At the top of the structure, is a 2020 recap web page 120 that provides a succinct presentation of key performance indicators (KPIs), business owner's priorities, financial projections, and the production workforce shift profile associated with the facility. In order to provide the data needed to generate the succinct business presentation, various data input web pages are provided, such as the categories web pages 124 and the update my personal reports web page 128. The category web pages 124 allow the user to enter data into the present invention (see, for example, Figures 6-9). The update web pages 128 allow the user to customize reports to better fit the particular needs of the user.

"What if? scenarios" web pages 133 allow the user to examine the effect of changing certain parameters, such as financial parameters, upon the user's facility. Data entry web page 135 allows the user to provide data specifically for the 2020 recap

results summary web page 120. An example of data entry web page 135 is Figures 10a and 10b.

Figure 4 depicts a 2020 recap which is a succinct presentation by the present invention of how well the collision repair facility is doing. Within the preferred embodiment of the present invention, the following areas or their equivalent are provided: a performance summary 200, a priority summary 204, a projection summary 208, and a production workforce shift profile summary 212.

Performance summary 200 is generated using a performance data structure with the structure depicted within region 216. The business performance data structure includes selected key performance indicators, facility/shop data, industry guidelines, a top 25% indicator, and whether opportunities exist to improve the business. For example, a key performance indicator within data structure 216 includes a production efficiency amount for the facility, industry guidelines, and top 25% indicator. As another example, total gross profit percent is provided for the shop, industry guides, and top 25%. An opportunity in this example has been identified by the present invention that the user's shop has a total gross profit percent of 38.5% which is below the 40.0% industry guideline and well below the top 25% value of 43.5%. An opportunity indicator 220 is generated by the present invention for the user to explicitly show that the user's shop can grow in this area in order to be more competitive relative to other shops. Specific aspects of the shop, such as paint, can be studied and analyzed by the present

invention. For example, monthly paint gallons of waste per paint technician is provided as an indicator for the user to review.

As another example, opportunity indicator 222 is generated by the present invention for the user to explicitly show that based upon the shop's monthly sales and number of staff employees the user's shop can most likely generate additional profits without adding staff.

In the preferred embodiment, performance data structure 216 includes the following indicators: annualized total sales amount, total gross profit percent, production proficiency, production staffing density (main shift), monthly sales per administrative employee, monthly sales per estimator, paint cost per paint hour billed, monthly gallons waste per paint technician, overall customer satisfaction index, and gross profit dollar amount per technician clock hour.

With selected performance indicators such as efficiency and staffing density, the user sees a spectrum of actual values and the shop's position on the spectrum. The user is neither intimidated by group averages that are high nor stifled by a low target. The user will find the performances of real shops at the shop owner's current performance and at any level of performance considered.

For example, Figure 11 depicts a computer screen showing how an user's shop compares to other shops, and not just how the user's shop compares with the top 25% of all shops. In this example, column 237 on Figure 11 depicts that the user's shop is above average for technician production efficiency relative to other shops as shown by

reference numeral 241. Column 239 depicts that the user's shop is below average for stalls per technician (main shift only) as shown by reference numeral 243.

With reference back to Figure 4, a business priorities data structure is depicted within region 240 in order to store and to display business priority information relevant to the user's shop. The business priorities data structure 240 includes business areas and indicators as to how strong the shop is within the areas. For example, a priority as selected by the user is the financial performance of the shop. Based upon the user's financial input data in this example, the financial performance of the shop is indicated as being relatively weak by the owner as shown by the strength indicator 244. If the user wanted to see the data and the calculation methods by which key performance indicators 200 were generated, the user clicks upon tab 248 to obtain greater detail about the data used to generate the performance indicators 200. In the preferred embodiment, owner priorities data structure 240 includes financial measures, financial performance, sales and marketing, customer satisfaction index, and insurance relations including cycle time, administration (general), administration (parts), production (general), production (refinish), facility (capacity, equipment, layout), and personnel including pay plans and incentives.

Projections summary 208 uses data structure 250 to handle the projections data associated with the shop. The data structure 250 includes performance factors, sales, gross profit, the additional amount of gross profit that would be generated given a certain level of improvement. Projections data structure 250 allows the user to pose

"what if" scenarios for assessing how much improvement the user shop would experience given different situations.

For example, the second performance factor in projections data structure 250 is directed to posing a "what if" scenario of what would be the increase in profits with a 10% improvement in production proficiency. Based upon the user's supplied input data, the projections module determines that with the a 10% improvement in production proficiency, the gross profit of the shop would be improved by $24,000 with sales of $1,470,000 and a gross profit of $540,000.

In the preferred embodiment, projections data structure 250 includes the following performance factors: current performance (annualized), "with 10% improvement in production efficiency" "performance with one additional technician" "with 10% improvement in parts:labor ratio", "with 2% improvement in labor gross profit", "with 2% improvement in parts gross profit" "with 2% improvement in materials gross profit" and "with cumulative impact of all improvements".

The production workforce shift profile summary 212 is generated using a production workforce data structure 260 that includes main shift only data, main shift plus overtime or Saturday data, main shift and second shift data, and main shift/second shift and Saturday data. Within summary 212, the dark portions 264 that the shop has a main shift plus an overtime shift, while the lighter portions 268 indicate that there is not a second shift nor a Saturday operations shift. The present invention utilizes within data structure 260 a breakout of the main shift from the other shifts, such as the second shift.

In this manner, the present invention is better able to assess facility utilization and potential for greater facility utilization. By the present invention's identifying main shift employees separately from second shift employees, the shop owner can not only obtain a better perspective of the utilization of the facility, but also have a more practical evaluation of actual stalls per technician for the primary shift.

If the user wanted to see how the data was generated or to input new data into the business analysis module, the user identifies within priority summary section 204 which priority detail needs examination. As an example, if the user wanted to enter in data for the first time relative to "insurance relations including cycle time", which is the fifth priority within summary section 204, the user clicks upon tab button 272. Upon clicking tab button 272, the user is directed to the insurance and cycle time area which would include the computer screen of Figure 5.

Figure 5 depicts a data entry and data display computer screen related to vehicle tracking and cycle time measurements and assessments. The present invention uses data structure 304 with the attributes listed in row 300 or equivalents thereof.

Cycle time data structure 304 includes a vehicle identifier to uniquely identify a vehicle that is undergoing a repair process. For example, the vehicle can be identified by an unique repair number supplied by the shop, a customer name, vehicle brand, vehicle year, and beginning date of the repair.

Data structure 304 also includes the steps which the vehicle is to undergo for repair. If the repair is due to a vehicle accident which would include a vehicle frame

reconstruction and repainting, then typical repair steps include the vehicle disassembly step, frame repair step, metal repair step, preparation step, painting step, reassembly step, and testing step. Data structure 304 not only tracks what step a vehicle is presently at but also includes whether a vehicle remains at a step for time greater than a predetermined amount. In the preferred embodiment, codes as shown in region 308 are placed at a step where a delay has occurred. For example, a "PI" code is used to indicate that the reason for delay was that there was a delay in delivery of the parts. A number preceding the code indicates the amount of time associated with the delay. In the preferred embodiment, the number indicates the additional days of delay, such as, for example, "2P2" indicates that there was a two day delay at a particular step due to incorrect parts being delivered. Accordingly, if for a vehicle at the frame repair step the code "2P2" appears, this indicates that there was a delay for two days for a vehicle where the frame could not be operated upon due to incorrect parts being delivered.

If a particular shop receives an inordinate amount of code "P2's", then this would indicate that there is a chronic problem of incorrect parts being delivered, possibly for example from a single source for a single brand of vehicle. This delay would adversely affect the strength indicator for cycle time and would also indicate that the problem could be addressed such as by possibly ordering parts from another supply shop for vehicles of that brand.

In the preferred embodiment, the present invention also includes the source category of the parts, such as whether the parts category is an OEM (original equipment

manufacturer) parts category, or an after market parts category, or a salvage parts category, or other types of parts category. Another embodiment includes using additional attributes to store the source category of the parts.

Data structure 304 includes the date upon which the vehicle's repair was completed as well as the final total amount expended to perform the repair. Thus, data structure 304 not only tracks the vehicle through a multi-step process, but also performs cycle time measurement by noting the amount of time of delay. The present invention performs cycle time analysis by providing the reason for the delay.

In the preferred embodiment, when a car enters each step, a symbol such as a "- - --" is entered in data structure 304. Each day, all vehicles in the vehicle repair facility are reviewed. If a vehicle has been worked upon for at least five hours, then nothing additionally is noted for the vehicle in data structure 304. However, if less than five hours has been expended for working upon a car, then the reason for the delay as well as the current delay time amount is entered into the appropriate step in data structure 304.

Data structure 304 also includes target analysis where desired target time repair values are compared against the actual time expended to repair a vehicle. In the preferred embodiment, the target analysis includes the number of labor hours sold, the labor hours divided by five hours, actual business days expended to repair the vehicle, and a cycle time efficiency metric. For example, if the number of labor hours sold to complete a vehicle repair process was 30 hours, the labor hours divided by 5 value

would be 6. If the actual days expended was 7 instead of the targeted six days, then the cycle time efficiency would indicate that 1 day had been lost .

Data structure 304 includes the insurance company being associated with a vehicle repair in order to capture delays associated with an insurance company. For example, if an inordinate number of "I1" insurance approval delay codes have been entered in data structure 304 for a particular insurance company, then the owner of the vehicle can be told that the reason for the delay was not the repair shop, but rather the insurance company that the vehicle's owner presently uses and that this insurance company is chronically late inspecting damaged vehicles.

Figure 6 provides an example of an user entering and viewing the detailed information used to generate sales and marketing summary information. In particular, Figure 6 is associated with the selling and sources of the business. The present invention provides multiple areas in this category for the user to provide information about their business. For example, the present invention asks for information related to a customer's first impression of the user's facility. A user clicks upon button 350 via a pointing device (such as a computer mouse) to see more detailed questions asked by the present invention as well as have access to an action planner for adding particular checklist items to the user's business plan. Upon clicking button 350, the user in this example is taken to the computer screen depicted in Figure 7.

With respect to Figure 7, more detailed questions are asked about the user's facility. For example, regarding the customer's first impression of the facility, more

detailed information is gathered via region 380. Questions include but are not limited to the user ranking overall impression of the shop from the street as being nonapplicable, weak, average or strong. Even more detailed questions may be asked regarding the overall impression by focusing the user upon the shop's signage, general appearance of the building and whether the shop has a clear and wide entrance. If the user deems necessary, such as if the user upon reflection believes that one or more of these questions indicate a weakness, the user can select to add this particular question to a 90-day business plan of the facility or add it to a one-year business plan of the facility. It should be understood that the present invention also includes the present invention allowing the user to bypass Figure 6 and proceed directly to the detailed questions of Figure 7.

Figure 8 provides an example of the present invention generating results after the user has provided information to the questions presented in Figure 7. For example, the signage question produced a weak response, the general appearance of the building produced a relatively strong response, while the clear and wide entrance question produced a very weak response. These responses as well as the other responses associated with the questions of region 380 contributed to a customer's first impression of the facility as being weak as shown by reference numeral 384. The user selected both the signage as well as clear and wide entrance questions to be added to the 90-day business plan.

Figure 9 shows the same computer screen as Figure 7, however populated with information supplied by the user. The results of the responses supplied by the user on Figure 9 shows the strength indicator relative to the customer's first impression of your facility by reference numeral 384. In this example, the user has supplied other information that the present invention is used to generate the strength indicators for the remaining business aspects in Figure 9.

Figures 10a and 10b show another example of the present invention acquiring data in order to provide business analysis to the user. The computer screen depicted in Figures 10a and 10b shows a customer data entry form for providing detailed information about the user as well as sales information and how many technicians work, on which days, for how many hours, and for which shift. This information is aggregated by the present invention and shown to the user in the succinct format depicted in Figure 4.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention and all such modifications that would be obvious to one skilled in the art are intended to be included within the scope of the following claims. For example, the present invention is not limited to vehicle collision repair shops, but extends to other multi-process vehicle operations or multi-process non-vehicle operations, such as but not limited to vehicle sales operations. For example, a vehicle

sales operation shop uses the present invention to analyze its business relative to performance, priorities, projections, and production workforce shift profiles.

WHAT IS CLAIMED IS:

1. A computer-implemented method for tracking a vehicle during a vehicle-related collision repair multi-step process, comprising the steps of:

receiving a vehicle identifier for uniquely identifying a vehicle;

receiving a delay reason for why the vehicle was delayed during at least one step of the multi-step collision repair process;

storing an association among the delay reason, the step at which vehicle delay occurred, and the vehicle identifier; and

using the stored association to identify at least one delay reason for the vehicle.

2. The method of claim 1 further comprising the steps of:

receiving amount of delay time associated with the delay reason; and

storing an association between the delay reason and the received amount of delay time; and

using the stored time delay amount association to identify for the vehicle at least one delay reason and the amount of time delay associated with the delay reason.

3. The method of claim 2 further comprising the steps of:

using codes to identify the delay reason and the amount of delay time associated with the delay reason;

using the codes in storing the association between the delay reason and the received amount of delay time; and

using the stored time delay amount association to identify for the vehicle at least one delay reason and the amount of time delay associated with the delay reason.

4. The method of claim 3 wherein the delay reason is selected from the group consisting of parts delayed reason, parts incorrect delay reason, parts damaged delay reason, parts fit delay reason, insurance approval delay reason, insurance supplemental approval delay reason, customer delay reason, frame department delay reason, metal department delay reason, paint department delay reason, employee out delay reason, sublet delay reason, and combinations thereof; said codes including a source category identifier.

5. The method of claim 2 further comprising the steps of:

receiving multiple delay reasons for why the vehicle was delayed during at least one step of the multi-step process;

storing an association among the delay reasons, the respective steps at which vehicle delays occurred, and the vehicle identifier; and

using the stored association to identify delay reasons for the vehicle.

6. The method of claim 3 further comprising the steps of:

storing amount of delay time the vehicle expends during a step of the multi-step process; and

conducting vehicle processing time delay analysis using the stored amount of delay time the vehicle expends during a step of the multi-step process.

7. The method of claim 3 further comprising the step of:

receiving a delay reason upon the vehicle being at a step not worked upon for a preselected daily target amount of time.

8. The method of claim 2 further comprising the steps of:

storing vehicle processing time target data and actual vehicle processing time data; and

conducting vehicle processing time delay analysis using the stored amount of delay time the vehicle expends during a step of the multi-step process.

9. The method of claim 1 wherein the multi-step process includes steps related to a vehicle collision repair process.

10. The method of claim 9 wherein the multi-step process includes at least one step selected from the group consisting of disassembly step, frame step, metal step, preparation step, paint step, reassembly step, testing step, detailing step, and combinations thereof.

11. The method of claim 1 wherein the vehicle identifier includes vehicle brand data, vehicle year data, and customer identifying data.

12. The method of claim 1 further comprising the steps of:

storing in a database the association among the delay reason, the step at which vehicle delay occurred, and the vehicle identifier.

13. The method of claim 1 further comprising the steps of:

storing in a relational database the association among the delay reason, the step at which vehicle delay occurred, and the vehicle identifier.

14. The method of claim 1 further comprising the steps of:

receiving the vehicle identifier over a network;

receiving the delay reason over the network;

retrieving the stored association from a database; and

sending over the network the stored association in order to use the stored association to identify at least one delay reason for the vehicle.

15. The method of claim 14 wherein the network is a global communications network connected by common protocols.

16. The method of claim 15 wherein the network is Internet.

17. A computer-implemented method for analyzing a vehicle-related business, comprising the steps of:

storing a business performance data structure stored in memory of at least one computer in order to summarize business performance data related to the business;

storing a business priorities performance data structure stored in the memory in order to summarize business priorities performance related to the business;

storing a business projections data structure stored in the memory in order to summarize business projections data related to the business;

storing a production workforce shift profile data structure in the memory in order to summarize product workforce shifts related to the business; and

generating a business summary report using the business performance data structure, the business priorities performance data structure, the business projections data structure, and the production workforce shift profile data structure.

18. The method of claim 17 wherein the business priorities performance data structure stores business performance-related categories, said method further comprising the step of:

indicating within the business summary report whether an improvement opportunity is present for at least one category within the business priorities performance data structure.

19. The method of claim 17 wherein the business priorities data structure stores business priorities-related categories, said method further comprising the step of:

displaying within the business summary report for at least one of the categories included within the business priorities data structure a strength indicator.

20. The method of claim 17 wherein the business projections data structure stores business projections-related categories, said method further comprising the step of:

generating within the business summary report for at least one of the categories sales, profit and profit improvement metrics.

21. The method of claim 17 wherein the business performance data structure stores categories selected from the group consisting of total sales, total gross profit percent, production productivity, production staffing density, monthly sales per administrative employee, monthly sales per estimator, paint cost per paint hour billed, monthly gallons waste per paint technician, overall customer satisfaction index, gross profit amount per technician clock hour, and combinations thereof.

22. The method of claim 21 further comprising the step of:

indicating within the business summary report whether an improvement opportunity is present for at least one of the categories within the business performance data structure.

23. The method of claim 22 wherein the business priorities data structure stores categories selected from the group consisting of financial measures, financial performance, sales and marketing, customer satisfaction index, insurance relations including cycle time, administration general, administration parts, production general, production refinish, facility, personnel including pay plans and incentives, and combinations thereof.

24. The method of claim 23 further comprising the step of:

generating within the business summary report for at least one of the categories included within the business priorities data structure a strength indicator.

25. The method of claim 24 wherein the business projections data structure stores categories selected from the group consisting of production proficiency improvement, additional technicians, parts to labor ratio improvement, labor gross

profits improvement, parts gross profit improvement, materials gross profit improvement, cumulative impact of all improvements, and combinations thereof.

26. The method of claim 25 wherein the business projections data structure include categories, said method further comprising the step of:

generating within the business summary report for at least one of the categories sales, profit and profit improvement metrics.

27. The method of claim 26 wherein the business includes a facility to perform at least one step of the multi-step process, said method further comprising the step of:

storing a production workforce shift profile in the memory in order to summarize product workforce shifts related to perform better utilization of the facility for the business.

28. The method of claim 17 wherein the business priorities data structure stores business priorities-related categories, said method further comprising the steps of:

generating a strength indicator on a computer screen within the business summary report for at least one of the categories; and

providing a link on the computer screen to enable viewing of detailed information, forms, and data related to the strength indicator.

29. The method of claim 28 wherein the detailed information includes management best practices for producing the strength indicator.

30. The method of claim 28 further comprising the step of:

providing links to forms, policies, procedures, pay plans in order to generate a customized operational manual for the business.

31. The method of claim 28 further comprising the step of:

providing a web page to enable ordering of items via Internet based upon the business summary report.

32. The method of claim 17 further comprising the steps of:

sending the business performance data structure, the business priorities performance data structure and the business projections data structure over a network to the memory of the computer.

33. The method of claim 32 wherein the network is a global communications network connected by common protocols.

34. The method of claim 33 wherein the network is Internet.

COMPUTER-IMPLEMENTED VEHICLE REPAIR ANALYSIS SYSTEM

ABSTRACT OF THE DISCLOSURE

A computer-implemented method and apparatus is provided for tracking a vehicle during a vehicle-related multi-step process. A vehicle identifier is received for uniquely identifying a vehicle. A delay reason is received for why the vehicle was delayed during at least one of the multi-step processes. An association is stored among the delay reason, the step at which the vehicle delay occurred, and the vehicle identifier. The stored association is used to identify at least one delay reason for the vehicle. The method and apparatus also analyze business aspects of the vehicle-related multi-step process and succinctly summarize the business analysis with respect to performance, priorities, projections, and production workforce shift profiles.

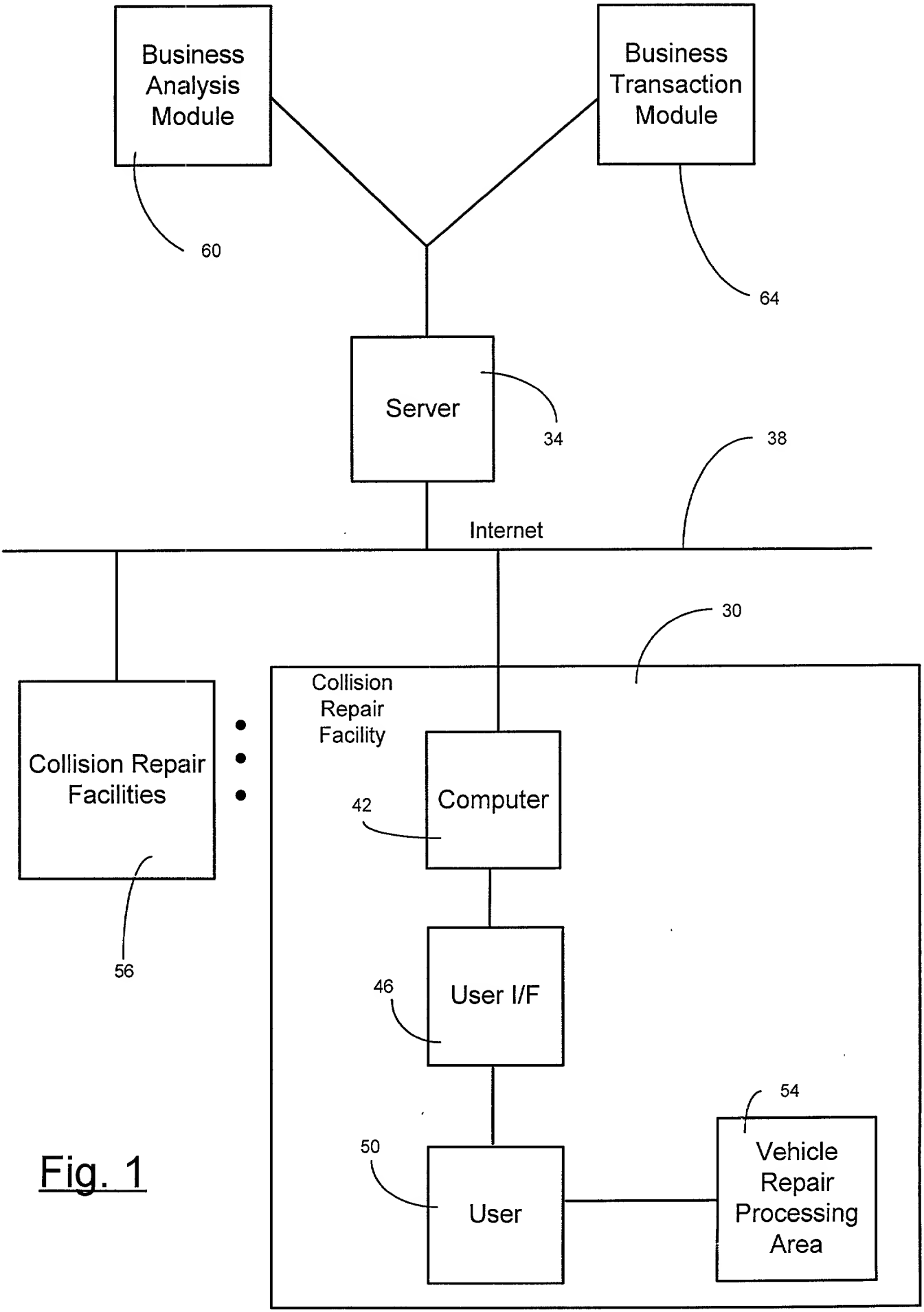
Business Analysis Module
Business Transaction Module
60
64
Server
34
38
Internet
30
Collision Repair Facility
Collision Repair Facilities
Computer
42
User I/F
46
54
50
User
Vehicle Repair Processing Area
56

Fig. 1

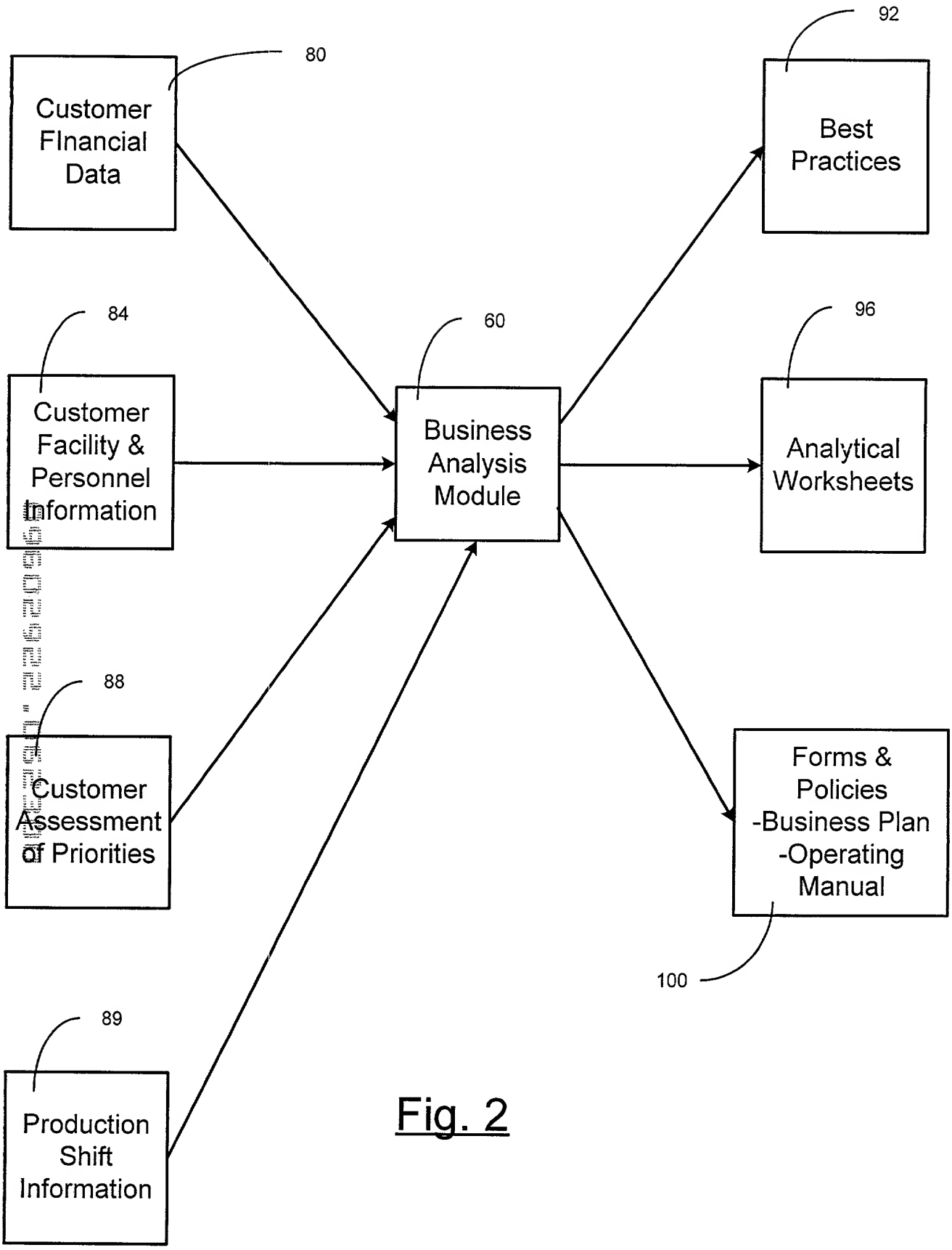
Customer FInancial Data
80
Customer Facility & Personnel Information
84
Customer Assessment of Priorities
88
Production Shift Information
89
Business Analysis Module
60
Best Practices
92
Analytical Worksheets
96
Forms & Policies -Business Plan -Operating Manual
100

Fig. 2

SITE ARCHITECTURE

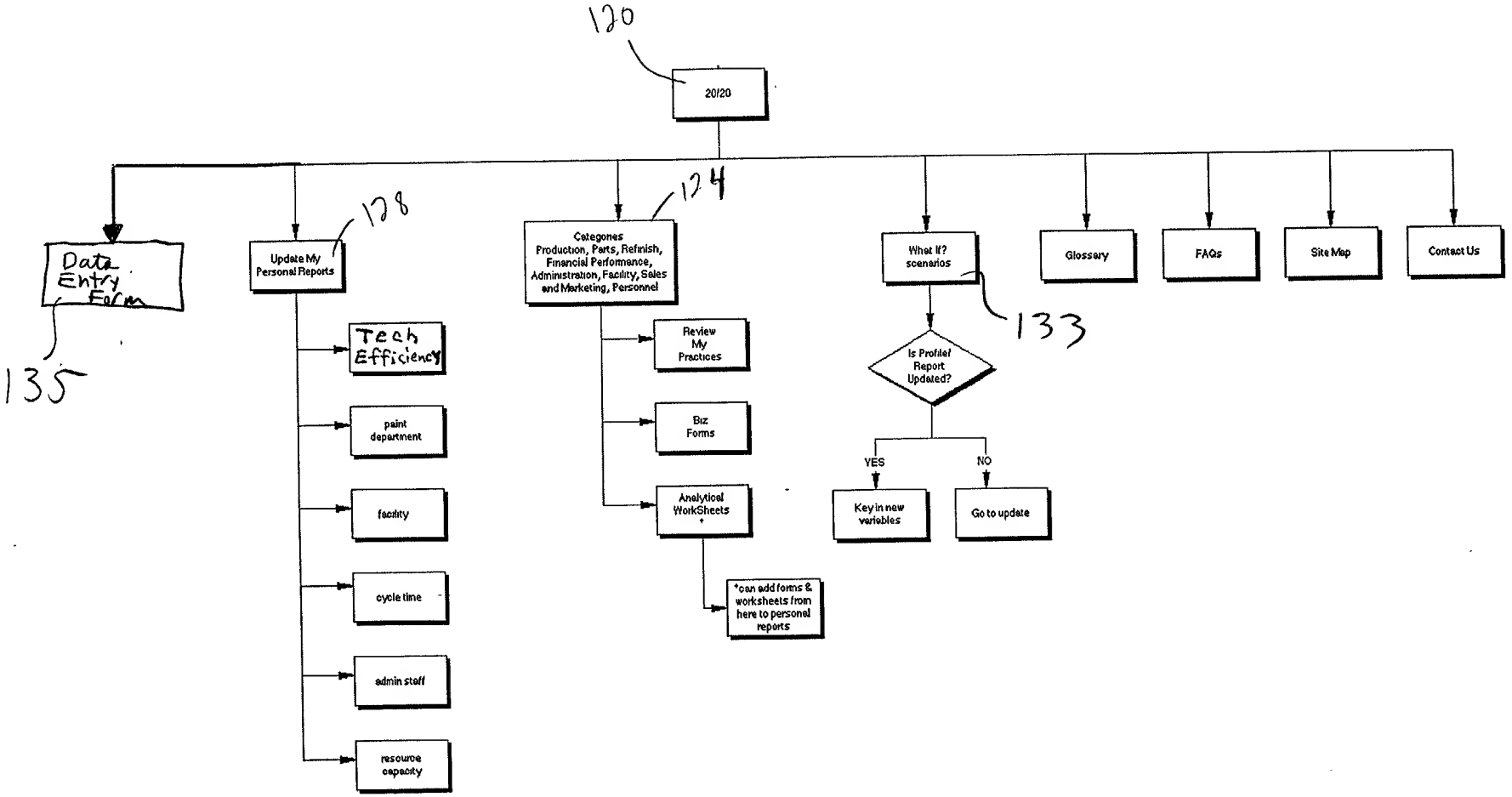

Fig. 3

Fig. 4

2020 Recap: Performance - Priorities - Projections — BASF VisionPLUS

Performance

	Selected Key Performance Indicators	Your Shop	Ind Guides	Top 25%	
1	Total Sales $ (Annualized)	$1,340,000	N / A	N / A	
2	Total Gross Profit Percent	38.5%	40.0%	43.5%	Opportunity
3	Production Proficiency	115%	135%	150%	Opportunity
4	Production Staffing Density (Main Shift)	2.3 : 1	2.0 : 1	1.7 : 1	
5	Monthly Sales / Administrative Emp	$23,500	$35,000	$45,000	Opportunity
6	Monthly Sales / Estimator	$111,500	$140,000	$160,000	
7	Paint Cost / Paint Hr Billed	$6.50	$7.00	$6.00	
8	Monthly Gallons Waste / Paint Tech	5	5	2	
9	Overall Customer Satisfaction Index	91.3%	90%	95.5%	
10	Gross Profit $ per Tech Clock Hour	$27.40	$35.00	$45.00	Opportunity

Priorities

	Business Areas & Priorities in Each	Priority	Strength	
1	Financial Measures			Tab 1
2	Financial Performance			Tab 2
3	Sales & Marketing			Tab 3
4	Customer Satisfaction Index			Tab 4
5	Insurance Relations inc. Cycle Time			Tab 5
6	Administration - General			Tab 6
7	Administration - Parts			Tab 7
8	Production - General			Tab 8
9	Production - Refinish			Tab 9
10	Facility - Capacity, Equipment, Layout			Tab 10
11	Personnel inc. Pay Plans & Incentives			Tab 11

Projections

	Performance Factors	Sales	Gross Profit	GP$ Improved
1	Current Performance (Annualized)	$1,340,000	$516,000	N / A
2	With **10%** improvement in **Production Proficiency**	$1,470,000	$540,000	$24,000
3	Performance with **One Additional Technician**	$1,500,000	$550,000	$34,000
4	With **10%** improvement in **Parts : Labor Ratio**	$1,400,000	$530,000	$14,000
5	With **2%** improvement in **Labor Gross Profit**	$1,340,000	$521,000	$5,000
6	With **2%** improvement in **Parts Gross Profit**	$1,340,000	$520,000	$4,000
7	With **2%** improvement in **Materials Gross Profit**	$1,340,000	$518,000	$2,000
8	With Cumulative Impact of All Improvements	$1,600,000	$640,000	$124,000

Production Workforce Shift Profile

Main Shift Only	Main Shift plus OT or Sat	Main Shift & 2nd Shift	Main Shift, 2nd Shift & Sat

BASF Customer Vehicle Tracking and Cycle Time Assessment Updated:

300

RO #	Cust Name	Veh Brand	Veh Year	Date Asgnd	Record reason for each day of 'Production Lost' D-Asm	Frame	Metal	Prep	Paint	R-Asm	Test	Date Compl	Final Amt $	Target vs. Actual Days: Lbr-Hrs Sold	Lbr-Hrs div by 5	Actual Days	Cycle Tm Profncy	Insurance Co

Sales & Marketing: Selling and Sources of Business

Note: This is the Sales & Marketing 'Sub-Page', the 1st of 11 Sub-pages

	N/A	Weak		Avg		Strong
1 Customer 1st Impression of Your Facility	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
2 Customer 1st Impression of Employees	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
3 2nd Impressions	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
4 Sales Close % on Estimates Written	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
5 Maximizing Repeat & Customer Referrals	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
6 Maximizing Insurance DRP Business	☐	☐	☐	☐	☐	☐
Cycle Time Performance (CTP) — *Link to Unique BASF Cycle Time Measurement Tools*						
Checklist and Action Planner — *Link to Detail Below*						
7 Maximizing Employee Referrals	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
8 Maximizing Dealership & Fleet Referrals	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
9 Maximizing 'Exposure' of Location	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
10 Advertising & Marketing Promotion	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						
11 Yellow Pages & Directories	☐	☐	☐	☐	☐	☐
Checklist and Action Planner — *Link to Detail Below*						

350

Fig. 6

Sales & Marketing: Selling and Sources of Business

Note: This is a portion of the detail of the Sales & Marketing 'Sub-Page', the 1st of 11 Sub-pages

380

	N/A	Weak	Avg	Strong	Add to 90-Day Plan	Add to One-Year Plan
1 Customer 1st Impression of Your Facility						
Overall impression from street						
Signage						
General Appearance of Building						
Clear wide entrance						
Appearance of Parking Area						
Parking places available						
Parking places well marked						
Estimating area marked						
Appearance of Reception Area						
Clean						
Comfortable						
2 Customer 1st Impression of Employees						
Telephone Answering & Handling						
Prompt						
Strong & Courteous Greeting						
Consistent greeting by all						
Back-up answering responsibility						
Customer Service Representatives						
Consistently Courteous						
Consistently Professional						
Consistently Customer Focused						
Impression of sales representatives						
Consistently Courteous						
Consistently Professional						
Consistently Customer Focused						
3 2nd Impressions						
Reception Area: Info on Display						
Steps in the Repair Process						
Refinish Warranty						
Employee Training Certifications						
Photos / Testimonials						
Production Area						
Neat & Clean 100% of time						
Employees in Uniforms						

Fig. 7

Sales & Marketing: Selling and Sources of Business

Note: This is the same portion of the detail of the Sales & Marketing 'Sub-Page', completed

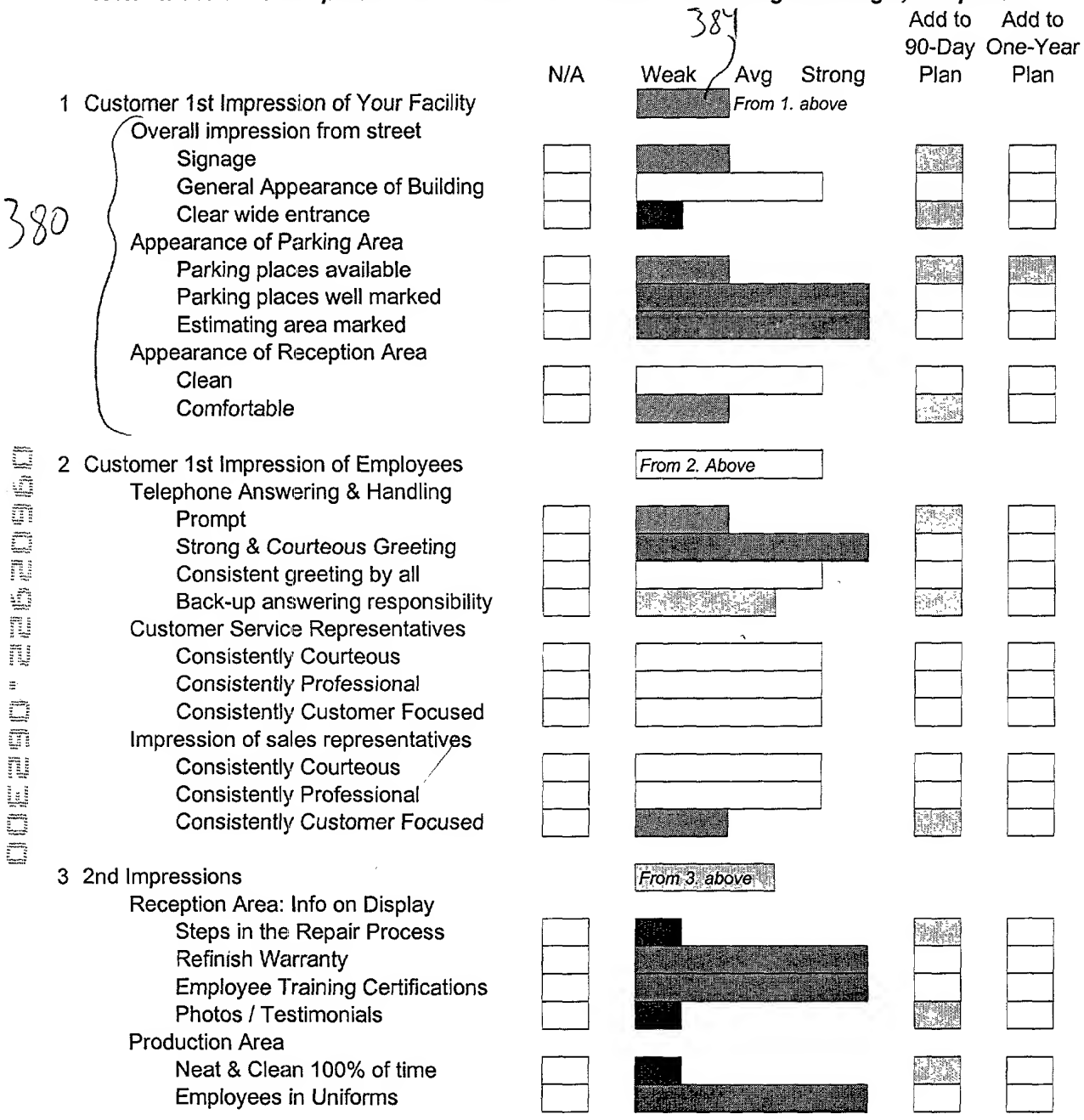

Fig. 8

Sales & Marketing: Selling and Sources of Business

Note: This is the same Sales & Marketing 'Sub-Page', as it might appear completed

	N/A	Weak	Average	Strong
1 Customer 1st Impression of Your Facility	☐			
Checklist and Action Planner *Link to Detail Below*				
2 Customer 1st Impression of Employees	☐			
Checklist and Action Planner *Link to Detail Below*				
3 2nd Impressions	☐			
Checklist and Action Planner *Link to Detail Below*				
4 Sales Close % on Estimates Written	☐			
Checklist and Action Planner *Link to Detail Below*				
5 Maximizing Repeat & Customer Referrals	☐			
Checklist and Action Planner *Link to Detail Below*				
6 Maximizing Insurance DRP Business	☐			
Cycle Time Performance (CTP) *Link to Unique BASF Cycle Time Measurement Tools*				
Checklist and Action Planner *Link to Detail Below*				
7 Maximizing Employee Referrals	☐			
Checklist and Action Planner *Link to Detail Below*				
8 Maximizing Dealership & Fleet Referrals	☐			
Checklist and Action Planner *Link to Detail Below*				
9 Maximizing 'Exposure' of Location	☐			
Checklist and Action Planner *Link to Detail Below*				
10 Advertising & Marketing Promotion	☐			
Checklist and Action Planner *Link to Detail Below*				
11 Yellow Pages & Directories	☐			
Checklist and Action Planner *Link to Detail Below*				

384

Fig. 9

Glasurit Leaders Group - Member Data Entry Form

Name of Business
Street Address
City, State, Zip

Contact
Title
Phone
Fax
e-mail

Dealer ☐ or Independent ☐
If Dealer, please list primary franchise(s)

Part of multiple shop ownership group? Yes ☐ No ☐
Name of group

Data covers how many months?
Final month of data
Today's Date (Mo / Yr)

Management System(s)

Estimating System(s)

Priorities

Opportunities / Weaknesses vs. Management Strengths	Weak		Average		Strong
Financial Measures					
Financial Performance					
Sales & Marketing					
Customer Satisfaction					
Insurance Rel & CTP*					
Admin - General					
Admin - Parts					
Production - General					
Production - Refinish					
Facility-Equip-Layout					
Personnel-Pay Plans					

88

Facility, Employees & Shift Profile

84

No. of Metal Stalls inc. Frame
Number of Metal Techs
No. Refinish Stalls inc. Booth
Number of Paint Booths
Number of Refinish Techs
No. Detailing Stalls
No. of Detailing Techs
No. Mechanical/Other Stalls
No. Mecahnical/Other Techs
Total # of Work Spaces
Total # of Technicians

No. Admin Emp inc. Estimators
Memo: No. Estimators

84

Sales Close Rate %
Number of RO's for time period

Overall Cust. Sat. Index (CSI) ~88

Production Dept Square Feet ~84

Number of Technicians by Shift / by Day	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday	
	Number of Techs	Average Hours	Number of Techs	Average Hours	Number of Techs	Average Hours	Number of Techs	Average Hours	Number of Techs	Average Hours	Number of Techs	Average Hours
Day Shift												
Overtime												
Afternoon Shift												

89

Fig. 10a

Glasurit Leaders Group - Member Data Entry Form

Sales, Gross Profit, Hours Sold & Hours Worked

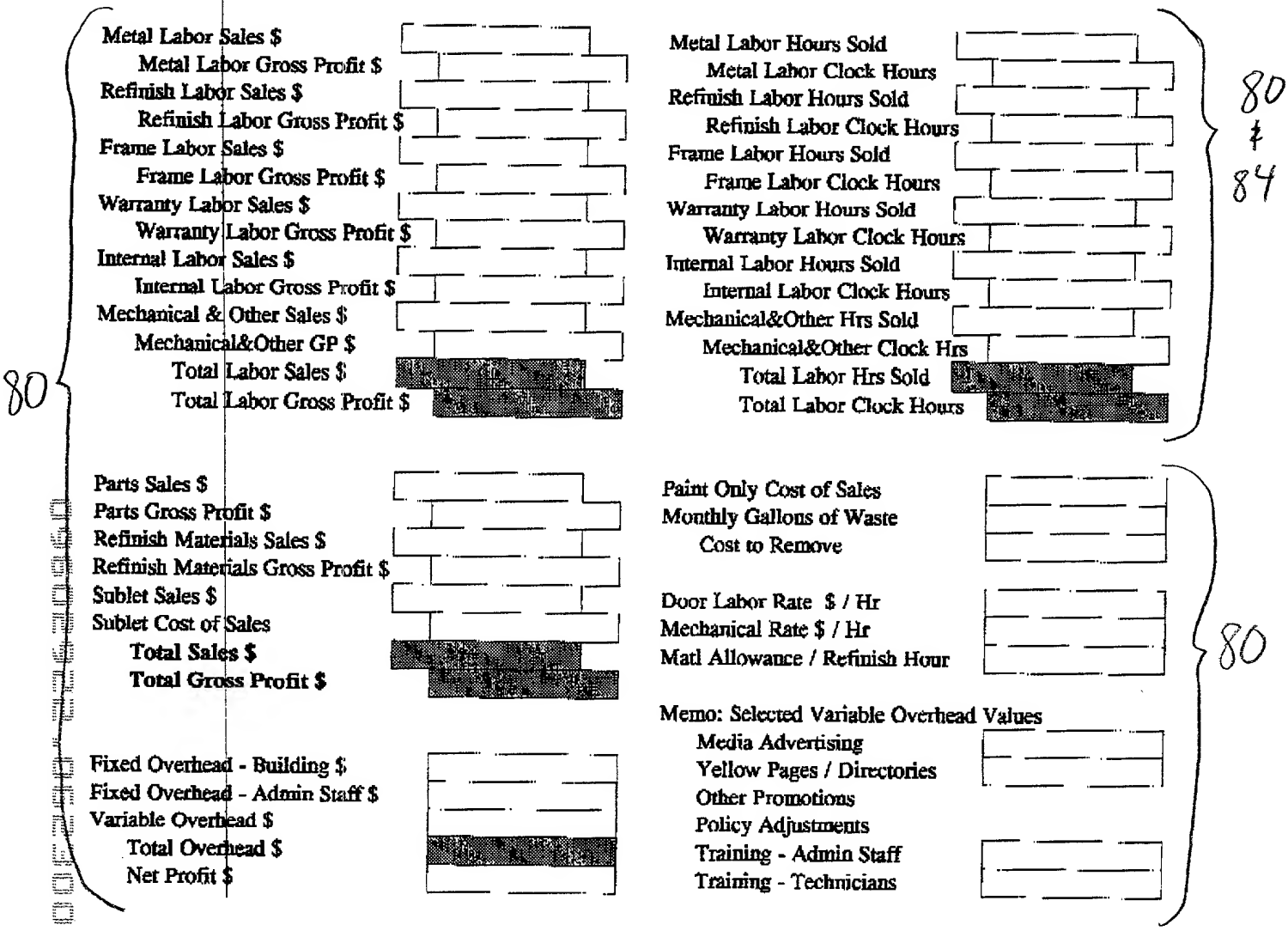

Fig. 10b

Technician Production Efficiency		Stalls per Technician Main Shift Only
186		1.0
184		1.2
173		1.4
165		1.5
160		1.6
159		1.6
153		1.7
152		1.8
149		1.8
144		1.8
140		1.8
139		1.9
138		1.9
135		1.9
134		1.9
131		1.9
You are here → 130		1.9
129		2.0
129		2.0
128		2.0
124		2.0
122		2.0
120		2.1
120		2.2
119		2.2
118		2.1
117		2.3
116		2.3
114		2.3
113		2.4
113		2.4
112		2.4
111		2.4
110		You are here → 2.6
110		2.7
109		2.8
106		2.9
105		2.9
103		2.9
102		3.0
100		3.0
99		3.0
98		3.0
98		3.1
95		3.2
93		3.2
92		3.2
90		3.5
88		3.5
87		4.0

*Values from recent sample of 50 shops.

241

243

237

239

Fig. 11